

APPENDIX TO AMENDMENT OF JULY 9, 2003

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please replace the paragraph beginning at page 3, line 26 with the following paragraph:

In another embodiment of the present invention, the storage means stores the background data by previously dividing it into a plurality of areas in advance; and the pre-reading means comprises a judging means for judging on which of the areas the reference line is crossing, and reading means for [reading] storing in the work memory the background data of the area judged as being crossed with the reference line by this judging means.

Please replace the paragraph beginning at page 10, line 4 with the following paragraph:

The communication device 33 is, for example, a modem or terminal adapter, structured to enable the access of this game device body 1, and to function as an adapter connecting this game device body 1 with an external circuit. The communication device 33 receives data transmitted from a server for game supply including an internet server to be connected to a public circuit net, and is able to supply [to] such data to the bus of the CPU block 30. A public circuit net may be a subscription line, dedicated line, wire/wireless, etc.

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Please replace the paragraph beginning at page 13, line 8 with the following paragraph:

The CPU 301, at first, reads operational information by a player (step S1), and specifies the current location of the vehicle and the proceeding direction on the xz face of the world coordinate system (step S2).

Please replace the paragraph beginning at page 13, line 20 with the following paragraph:

On the [contrary] other hand, when the judgment is "yes" at step S3; i.e. reading start line LN2 crosses one or more [than one] new area ARs, the CPU 301 judges whether there are any required number of consecutive memory block MBs unused in the main memory 302 (step S4). However, in case the number of required memory blocks to store background data is one, "required number of consecutive memory block" means one memory block. When a judgment at this step S4 is "yes," background data (landform data) is to be read from a new area AR, and written in the vacant memory block.

Please replace the paragraph beginning at page 14, line 1 with the following paragraph:

On the other hand, when the judgment is "no" at step S4[;], i.e. there are no required number of consecutive memory blocks unused, the CPU 301 judges whether,

in case of a city, for example, there are required number of memory blocks which stores background data consecutively for one city area in used memory blocks MB, (step S6). When this judgment is "yes," background data for a new area AR is to be stored in the memory block which represents the largest value (step S7) by comparing the count values corresponding to the memory block MB. It can be assumed that a large count value suggests that the frequency of usage for the background data of the memory block was low in the past, and will be the same in the future as well. Accordingly, background data of such memory block takes priority to be renewed.

Please replace the paragraph beginning at page 14, line 15 with the following paragraph:

On the [contrary] other hand, when the judgment is "no" at step S6, search is made for memory blocks that [stores] store background data consecutively over areas with a plurality of types, and more than one set of required number of blocks is assured by combining them (step S8). Next, for each set of the consecutive memory [block] blocks, the average count value of the respective memory blocks [are operated] is computed (step S9). Furthermore, the CPU 301 compares [operated] computed count values, judges a set of memory blocks with the largest count value, and stores in the memory background data of the new area AR for the respective memory blocks of the set (step S10). The reason for searching a set of memory blocks with the largest count value is the same as the above.

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Please replace the paragraph beginning at page 15, line 11 with the following paragraph:

[On the contrary, the] The example of Fig. 9 indicates a renewing process of the memory block MB with background data stored in the past by new background data. In other words, this indicates that, after detecting a new area and renewing the past consecutive background data with the new background data, vehicles have already moved into this new area. Especially, the example of Fig. 9 explains the condition that requires four consecutive memory blocks as places to secure the background data of the new area. Accordingly, the average count value was operated through the processing of steps S3, S4, S6 and S8 through S10 in Fig. 7, and memory block Nos. 6 through 9 were selected. In this case, an adjacent memory block No. 10 is handled as a vacant block. In this example, background data read later (for example, background data of block Nos. 6 through 10) is deleted earlier than those read previously (for example, background data of block Nos. 1 through 5). This is because the running course of vehicle is not linear, but, in many cases, so-called "meandering" or "zigzag" running, in which vehicles directly enter into the area read in the past from another course.

IN THE CLAIMS

1. (Twice amended) A game device which reads from a storage means, prior to image processing, background data required in games for displaying a moving object within a virtual three-dimensional space together with a background, comprising:

pre-reading means for pre-reading said background data from said storage means by establishing an area for pre-reading which includes: setting a predetermined angle-of-visibility based on a direction of the moving object, setting a limit-line of a visual field at a predetermined distance towards a front of the visual field, and setting a pre-reading start line at a predetermined distance [towards the] beyond a front of the limit-line of the visual field;

wherein said storage means stores said background data by dividing said background data into a plurality of areas in advance;

said pre-reading means comprising judging means for judging on which of said areas said pre-reading line is crossing, and reading means for reading the background data of the area judged as being crossed with said pre-reading line by this judging means;

wherein said plurality of areas are respectively stored in said storage means by dividing the content of background data per type;

said game device further comprising a work memory including a plurality of memory blocks each set at a same memory capacity;

wherein said reading means includes means for storing the background data of the crossed area in an integral number "n" of said memory blocks in said work memory in accordance with the amount of the background data to be stored;

wherein said reading means includes means for judging whether one or more of said memory blocks of said work memory are vacant space or not, and means for successively storing the background data of said crossed area in said integral number n

of said memory blocks when said integral number of said memory blocks are judged as vacant space and of sufficient capacity to store the background data;

said game device further comprising counting means for detecting whether said moving object exists within said areas corresponding to memory blocks storing background data, or an area that exists within the visual field, in said work memory, and counting said moving object or visual field area periodically,

wherein said reading means includes means for determining the memory block to store said background data based on a count value determined for each of said memory blocks by said counting means when it is judged that there is no vacant space in said work memory.

6. (Amended) A game device according to claim [4] 1, wherein said reading means includes determining means for determining a plurality of consecutive memory blocks when background data to be stored requires a plurality of memory blocks.

7. (Twice amended) A game device according to claim [5] 1, wherein said determining means is for determining a plurality of consecutive memory blocks representing [the] a highest or lowest value by comparing said count values of said plurality of consecutive memory blocks.

8. (Twice amended) A game device according to claim [5] 1, wherein said determining means is for determining a plurality of consecutive memory blocks

representing [the] a highest or lowest value by [operating the] computing average values for said plurality of consecutive memory blocks.

10. (Twice amended) A game device according to Claim 1, wherein said background data is landform data prepared to enable [said] a vehicle to travel in arbitrary directions on [the] land represented by the background data.

11. (Three times amended) A data processing method for a game device comprising:

reading background data required for a game that displays a moving object within virtual three-dimensional space together with background in working memory from memorizing means prior to image processing, wherein said background data is pre-read from [said] a recording medium by establishing an area for pre-reading which includes: setting a predetermined angle-of-visibility based on a direction of the moving object, setting a limit-line of a visual field at a predetermined distance towards a front of the visual field, and setting a pre-reading start line at a predetermined distance [towards the] beyond a front of the limit-line of the visual field;

said recording medium storing said background data by dividing said background data into a plurality of areas in advance, said plurality of areas being respectively stored in said recording medium by dividing the content of background data per type and approximately the same size;

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judging on which of said areas said pre-reading start line is crossing, and reading the background data of the area judged as being crossed with said pre-reading start line;

storing background data of the crossed area in an integral number "n" of memory blocks in said working memory in accordance with an amount of the background data to be stored, said working memory including a plurality of memory blocks each set at a same memory capacity;

judging whether one or more memory blocks of said working memory are vacant space or not, and successively storing the background data of said crossed area in said integral number n of said memory blocks judged as vacant space and of sufficient capacity to store the background data;

detecting whether said moving object exists within any of said plurality of areas corresponding to memory blocks storing background data, or an area that exists within the visual field, in said working memory, and counting said moving object or area periodically,

determining the memory block to store said read background data based on a count value determined for each of said memory blocks by said counting when it is judged that there is no vacant space in said working memory.

12. (Twice amended) [Information] An information recording medium having recorded therein said background data and programs for executing the respective means according to [any one of Claims] Claim 1 [through 10].

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